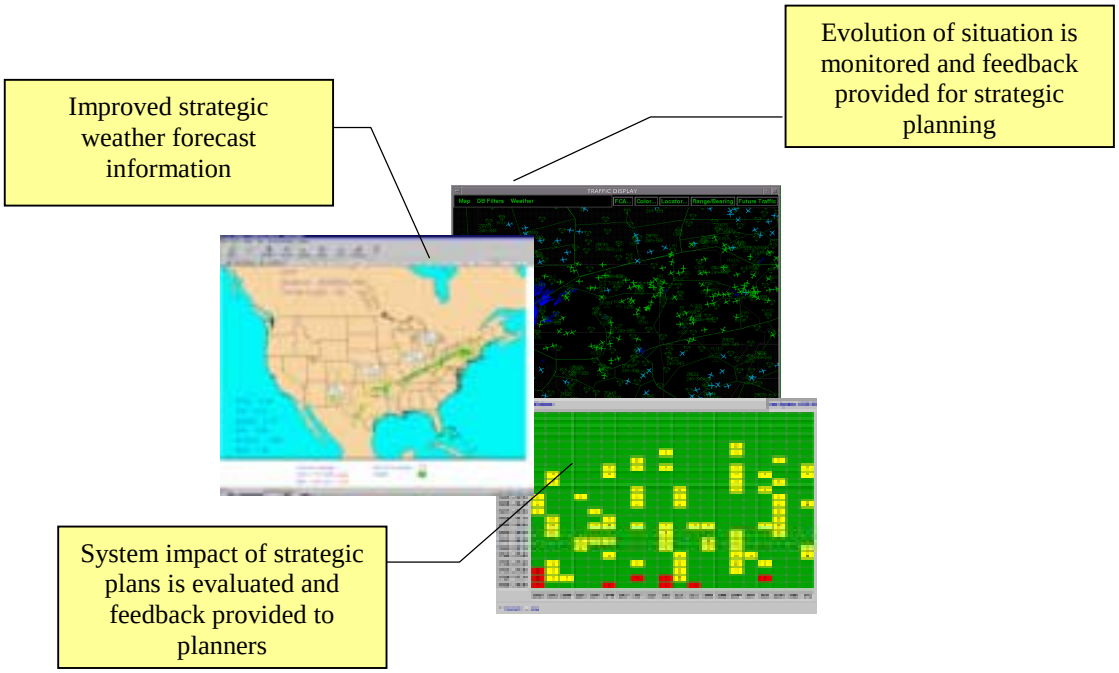
EW-1: Provide Better Hazardous Weather Data

Improved predictability in convective weather forecast products with respect to growth, decay, movement, intensity, and coverage of thunderstorm activity, which will lead to a more efficient operational response to the weather condition.



Background

Problems generated by en route hazardous weather involve uncertainties due to changes in NAS capacity and the often-unpredictable nature of convective weather. The convective weather forecast prediction accuracy is not well suited to the strategic planning time frame of traffic flow decisions. In addition, lack of forecast fidelity with respect to timing makes impacted flight identification difficult at best, leading to the belief by many that areas forecast to have convective activity, regardless of probability, need to be treated as “no fly zones” for the planning process. Additional difficulties arise from limited real-time, data sharing capabilities.

Ops Change Description

Improvements will be evolutionary and will span the near, mid, and long term timeframes. The key operational change is improving NAS predictability as a by-product of a high confidence level in the accuracy of convective weather forecasts. Operational change will be highly dependent on the state-of-the art science and research of forecasting convective weather growth, decay, movement, intensity, and coverage. Therefore, operational change with respect to common situational awareness, common data exchange, and operational significance of current forecast products (e.g., an

understanding that the CCFP is for guidance and not for required compliance) should be improved through a focus on training and the SPT process (identified in smart sheet ER-2) while work continues on improving convective weather forecasting. The following sections address the operational changes described:

- EW-1.1: Improved weather reporting and forecasting.
- EW-1.2: Dissemination of common weather information.
- EW-1.3: More precise identification of flights to be impacted by severe weather.
- EW-1.4: Display detailed weather to controllers.

Benefit, Performance and Metrics

- Reduction in variance of execution against plan.
- Reduction in number and/or duration of ground delay programs in support of SWAP for en-route hazardous weather constraints.
- Reduction in the number and/or duration of ground stops due to hazardous en-route weather constraints. Reduction in fuel diversions due to hazardous weather encountered.
- Increased equity plus better plans equals an increase in system access/equity. This equity is achieved from narrowing the confidence gap that exists today from one system user to another or one FAA facility to another. Measurement of system access and area throughput along with analyzing user acceptance of the plan will determine forecast confidence.

EW-1.1 Improved Weather Reporting and Forecasting

Scope and Applicability

Near-Term:

- The Collaborative Convective Forecast Product (CCFP) is a collaborative product, developed by the Aviation Weather Center (AWC), Center Weather Service Units (CWSU), and Airline meteorological departments. Improvements in the collaboration, issuance times, and operational applications are currently under study for the year 2001 convective weather season.

Mid-Term/Long-Term:

- The FAA Aviation Weather Research Program (AWRP) has the lead for improved weather products and forecasting capabilities. Development of early and more precise identification of hazardous weather, to flights in the en-route

environment, will lead to improved strategic planning and tactical applications of route management.

- Current AWRP product team research that applies to the en-route environment include:
  - Aviation Gridded Forecast System
    - Products: Aviation Digital Data Service
    - Real Time Verification System
  - In-flight Icing
    - Products: Integrated Icing Diagnosis Algorithm
    - Integrated Turbulence Forecasting Algorithm
  - Model Development and Enhancement
    - Products: Rapid Update Cycle
    - Weather Research and Forecasting
  - NEXRAD Enhancements
    - Products: Rapid Product Update
    - Convective Growth and Decay
    - Mesocyclone Detection
  - Convective Weather
    - Products: Terminal Convective Weather Forecast
    - National Convective Weather Forecast
    - Concept: Corridor Integrated Weather System, CIWS (funding and program location needed)
  - Turbulence
    - Products: Turbulence Forecasting Integrated Turbulence Forecast Algorithm
    - Turbulence Observation In-Situ Measurement and Reporting
- Integrated ground based and/or airborne sensor/system improvements applied to weather products and decision support systems (DSS). Candidate sensor and system applications include:
  - Operational and Supportability Improvement System (OASIS).
  - ASOS Controller Equipment – Information Display System (ACE-IDS).
  - Stand Alone Weather Sensor (SAWS).
  - Automated Weather Sensor System (AWSS).

- A combination of NEXRAD and ITWS data for the high traffic corridor between Chicago and the Northeast Airports providing full high definition color weather radar.

Key Decisions

- Installation of sensors or radar facilities as appropriate, including environmental impact studies.
- Increase adoption of user Pilot Reports programs (e.g., Northwest and United Airlines turbulence information programs).

Key Risks

- Funding of AWRP programs.
- Community roadblocks to radar or sensor installations.
- Operational significance of the anticipated improvements made to convective weather forecast.
- Speed of the research and development of weather sciences.
- National Weather Service cost/benefit analysis for producing additional aviation weather products and systems.
- Cost/benefit analysis for outfitting aircraft with additional weather sensing equipment.

EW-1.2 Dissemination of Common Weather Information

Scope and Applicability

Near-Term:

- Collaborative Convective Forecast Products (CCFP) dissemination and access improvements based on recommendations from Spring/Summer 2000 review for the broadest range of stakeholders. The focus on this effort is to ensure the CCFP is available on the ATCSCC web site and the Aviation Weather Center (AWC) web site.
- Runway Visual Range (RVR) information is currently being provided to users via the CDMNet. Two airports, Memphis and Boston are reporting for information only purposes but additional airports will be incorporated as data ports are added into the ETMS network.
- Identify policies, procedures, and issues that are barriers to exchange of weather information.

Mid- and Long-Term:

- Weather information use and dissemination that can be used to support strategic planning.

Key Decisions

- Weather research funding.
- Infrastructure needed for the dissemination of weather products and for system access (e.g., web access policies and/or exploration of other means of general distribution of community use weather products).

Key Risks

- Speed of improvements in the state-of-the-art of weather science.

EW-1.3 More Precise Identification of Flights to be Impacted by Severe Weather

Scope and Applicability

Near-Term:

- Flow Constrained Area (FCA) tool with additional CRCT capability will be implemented in ETMS. FCA's will provide identification of specific flights that will be affected by severe weather for more targeted resolutions.
- Policies, procedures, and practices for identifying and disseminating list of affected flights using FCA capabilities and reaching resolution on actions to be taken.
- A tool to provide Traffic Management Specialist capabilities to assess the impact of proposed flow management strategies on NAS flows.
- DSP assigns a departure time to achieve a constant flow of traffic over a common point. Runway and departure procedures must be considered for accurate projections.

Mid-Term:

- Additional flight filtering and CRCT re-route functionality will be implemented in ETMS.
- Automation development for communication flight plan changes quickly.

- Information to produce solutions to airspace capacity and en route weather constraint problems.

Key Decisions

- Early intent filings (e.g., proposed four hours prior to departure) by the NAS users, to enhance ETMS data quality, for improved flight identification and predictability.
- Define collaborative processes and procedures for using FCA capabilities in ETMS.

Key Risks

- Speed of the research and development of weather sciences.

EW-1.4 Display Detailed Weather to Controllers

Scope and Applicability

Mid-Term:

- Development of policies and procedures prior to implementation of weather display on DSR.
- Full deployment of baseline weather-on-controller-display (DSR) requirements (e.g., procedural changes) to ensure controller has accurate weather information from which to identify potential impact areas.
- AWRP is developing actions and milestones to achieve the objective for the mid term to long-term.

Key Decisions

- Roles and responsibilities with respect to hazardous weather avoidance (NATCA, TWU, ADF, ALPA, APA, NBAA, RAA).

Key Risks

- Agreement on roles, responsibilities, and accountability issues.
- Deployment of required interfaces (e.g., WARP/DSR) is complex process and may induce schedule delays and additional requirements (e.g., security).